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<110> Hudson et al.
<120> Human Choline Acetyltransferase
<130> PF146P1D3
<150> US 09/939,573
<151> 2001-08-28
<150> US 09/210,993
<151> 1998-12-15
<150> US 08/464,601
<151> 1995-06-05
<150> PCT/US94/13570
<151> 1994-11-23
<160> 8
<170> PatentIn version 3.1
<210> 1
<211> 2034
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<220>
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<222> (1) .. (2034)
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| ggt cag ctc cga ttt gct gcc aaa ctc att gag ggt gtg ttg gtt ttc Gly Gln Leu Arg Phe Ala Ala Lys Leu Ile Glu Gly Val Leu Val Phe 115 120 125 | 384 |
| aag gtc atg att gac aac gag acc ctg ccc gtg gag tac ctg ggg ggg Lys Val Met Ile Asp Asn Glu Thr Leu Pro Val Glu Tyr Leu Gly Gly 130 135 140 | 432 |
| aag cca ctg tgc atg aac cag ttc tat cag atc ttg tcc tcc tgc cga Lys Pro Leu Cys Met Asn Gln Phe Tyr Gln Ile Leu Ser Ser Cys Arg 145 150 155 160 | 480 |
| gtg ccg ggc ccc aag cag gac aca gtc agc aac ttc agc aag acc aag Val Pro Gly Pro Lys Gln Asp Thr Val Ser Asn Phe Ser Lys Thr Lys 165 170 175 | 528 |
| aag cct ccc acg cac atc acc gtg gta cac aac tac cag ttt ttt gag Lys Pro Pro Thr His Ile Thr Val Val His Asn Tyr Gln Phe Phe Glu 180 185 190 | 576 |
| ctg gat gtg tac cac agt gac ggg aca ccc ctc act gcg gat cag atc Leu Asp Val Tyr His Ser Asp Gly Thr Pro Leu Thr Ala Asp Gln Ile 195 200 205 | 624 |
| ttt gtg cag ctg gag aag atc tgg aac tca tcc cta cag acc aac aag Phe Val Gln Leu Glu Lys Ile Trp Asn Ser Ser Leu Gln Thr Asn Lys 210 215 220 | 672 |
| gag cct gtg ggc atc ctc acc tcc aac cac cgc aac tcc tgg gcc aag Glu Pro Val Gly Ile Leu Thr Ser Asn His Arg Asn Ser Trp Ala Lys 225 230 235 240 | 720 |
| gca tac aac acc ctc atc aaa gac aag gtg aac cgg gat tcc gtg cgc Ala Tyr Asn Thr Leu Ile Lys Asp Lys Val Asn Arg Asp Ser Val Arg 245 250 255 | 768 |
| tcc atc cag aag agc atc ttc acc gtg tgc cta gat gca acc atg ccc Ser Ile Gln Lys Ser Ile Phe Thr Val Cys Leu Asp Ala Thr Met Pro 260 265 270 | 816 |
| agg gtc tca gaa gac gtg tac cgc agc cac gtg gca ggc cag atg ctg Arg Val Ser Glu Asp Val Tyr Arg Ser His Val Ala Gly Gln Met Leu 275 280 285 | 864 |
| cat ggg ggc ggc agc agg ctc aac agc ggc aac cgc tgg ttc gac aag His Gly Gly Gly Ser Arg Leu Asn Ser Gly Asn Arg Trp Phe Asp Lys 290 295 300 | 912 |
| acg ctg cag ttc atc gtg gca gaa gat ggc tcc tgt ggg ctt gtg tac Thr Leu Gln Phe Ile Val Ala Glu Asp Gly Ser Cys Gly Leu Val Tyr 305 310 315 320 | 960 |
| gag cat gct gca gcg gag ggg ccc cct att gtc acc ctt ctg gac tat Glu His Ala Ala Glu Gly Pro Pro Ile Val Thr Leu Leu Asp Tyr 325 330 335 | 1008 |

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| gtc atc gag tac acg aag aaa ccc gag ctt gtg cgg tct ccc atg gtg Val Ile Glu Tyr Thr Lys Lys Pro Glu Leu Val Arg Ser Pro Met Val 340 345 350 | 1056 |
| ccc ctg ccc atg ccc aag aag ctg cgg ttc aac atc acc ccc gag atc Pro Leu Pro Met Pro Lys Lys Leu Arg Phe Asn Ile Thr Pro Glu Ile 355 360 365 | 1104 |
| aag agc gac atc gag aag gcc aag cag aac ctc agc atc atg atc cag Lys Ser Asp Ile Glu Lys Ala Lys Gln Asn Leu Ser Ile Met Ile Gln 370 375 380 | 1152 |
| gac ctg gat atc acc gtg atg gtg ttc cac cat ttt gga aaa gac ttc Asp Leu Asp Ile Thr Val Met Val Phe His His Phe Gly Lys Asp Phe 385 390 395 400 | 1200 |
| ccc aag tcg gag aag cta agc cca gat gcc ttc atc cag atg gct ttg Pro Lys Ser Glu Lys Leu Ser Pro Asp Ala Phe Ile Gln Met Ala Leu 405 410 415 | 1248 |
| cag ctg gcc tac tac agg ttc tac gga aag gaa tgt gcc acc tat gaa Gln Leu Ala Tyr Tyr Arg Phe Tyr Gly Lys Glu Cys Ala Thr Tyr Glu 420 425 430 | 1296 |
| agt gcc tcc ctg cgc atg ttt cac ctg ggg cgc acc gac acc atc cgc Ser Ala Ser Leu Arg Met Phe His Leu Gly Arg Thr Asp Thr Ile Arg 435 440 445 | 1344 |
| tcg ggt tcc atg gac tca ctc acc ttt gtc aag gcc atg gat gac tcc Ser Gly Ser Met Asp Ser Leu Thr Phe Val Lys Ala Met Asp Asp Ser 450 455 460 | 1392 |
| agc gtc acg gag cac cag aag gtg gag ctg ctg cgg aag gcc gtg cag Ser Val Thr Glu His Gln Lys Val Glu Leu Leu Arg Lys Ala Val Gln 465 470 475 480 | 1440 |
| gcc cac cga ggt tac acc gac cgg gcc atc cgg ggg gag ggc ttt gat Ala His Arg Gly Tyr Thr Asp Arg Ala Ile Arg Gly Glu Gly Phe Asp 485 490 495 | 1488 |
| cga cac ctg ctg ggc ctg aag ctg cag gcc atc gag gac ctg gtg agc Arg His Leu Leu Gly Leu Lys Leu Gln Ala Ile Glu Asp Leu Val Ser 500 505 510 | 1536 |
| atg ccc gac atc ttc atg gac acc tcc tac gcc atc ggc atg tac ttc Met Pro Asp Ile Phe Met Asp Thr Ser Tyr Ala Ile Gly Met Tyr Phe 515 520 525 | 1584 |
| cac ctc tcc acc agg cag gtc cct gcc aag aag atg tgt cat gtt ctt His Leu Ser Thr Arg Gln Val Pro Ala Lys Lys Met Cys His Val Leu 530 535 540 | 1632 |
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| ggc cac atc aac ttc tcc ctg tcg gac tac aaa agg tgg ggg gag acc Gly His Ile Asn Phe Ser Leu Ser Asp Tyr Lys Arg Trp Gly Glu Thr 565 570 575 | 1728 |

aac gcc gcc cgc ctg gtg tat tac ctg gag aag gcg ctc ctg gac atg 1776
 Asn Ala Ala Arg Leu Val Tyr Tyr Leu Glu Lys Ala Leu Leu Asp Met
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cgt gcc ctg gtg aag agc cac ccc cgg gcc aag ttc tta gcc cct agg 1824
 Arg Ala Leu Val Lys Ser His Pro Arg Ala Lys Phe Leu Ala Pro Arg
 595 600 605

act cag gcc tgc caa tgc cac agg caa gcc cac cct agg atg ggc cac 1872
 Thr Gln Ala Cys Gln Cys His Arg Gln Ala His Pro Arg Met Gly His
 610 615 620

cca cca ggg atc agc tcc ttg gtt ccc tct tcc ttg gtt ccc tct tcc 1920
 Pro Pro Gly Ile Ser Ser Leu Val Pro Ser Ser Leu Val Pro Ser Ser
 625 630 635 640

ctg gtc ccc cca att cta ctg agc cac gga ccg cat cct cca ggg ggc 1968
 Leu Val Pro Pro Ile Leu Leu Ser His Gly Pro His Pro Pro Gly Gly
 645 650 655

tgc agg ccc agc caa gtg cct tcc gtg ggt cat ccc agc acc tgc cag 2016
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 660 665 670

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 Gly Pro Thr Trp Gly
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<400> 2

Met Lys Ala Ser Ser Arg Phe Lys Ala His Gln Asp Ala Leu Pro Arg
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Leu Gln Pro Ile Val Ser Glu Glu Glu Trp Ala His Thr Lys Gln Leu
 35 40 45

Val Asp Glu Phe Gln Ala Ser Gly Gly Val Gly Glu Arg Leu Gln Lys
 50 55 60

Gly Leu Glu Arg Arg Ala Arg Lys Thr Glu Asn Trp Leu Ser Glu Trp
 65 70 75 80

Trp Leu Lys Thr Ala Tyr Leu Gln Tyr Arg Gln Pro Val Val Ile Tyr
 85 90 95

Ser Ser Pro Gly Val Met Leu Pro Lys Gln Asp Phe Val Asp Leu Gln
 100 105 110

Gly Gln Leu Arg Phe Ala Ala Lys Leu Ile Glu Gly Val Leu Val Phe
 115 120 125

Lys Val Met Ile Asp Asn Glu Thr Leu Pro Val Glu Tyr Leu Gly Gly
 130 135 140

Lys Pro Leu Cys Met Asn Gln Phe Tyr Gln Ile Leu Ser Ser Cys Arg
 145 150 155 160

Val Pro Gly Pro Lys Gln Asp Thr Val Ser Asn Phe Ser Lys Thr Lys
 165 170 175

Lys Pro Pro Thr His Ile Thr Val Val His Asn Tyr Gln Phe Phe Glu
 180 185 190

Leu Asp Val Tyr His Ser Asp Gly Thr Pro Leu Thr Ala Asp Gln Ile
 195 200 205

Phe Val Gln Leu Glu Lys Ile Trp Asn Ser Ser Leu Gln Thr Asn Lys
 210 215 220

Glu Pro Val Gly Ile Leu Thr Ser Asn His Arg Asn Ser Trp Ala Lys
 225 230 235 240

Ala Tyr Asn Thr Leu Ile Lys Asp Lys Val Asn Arg Asp Ser Val Arg
 245 250 255

Ser Ile Gln Lys Ser Ile Phe Thr Val Cys Leu Asp Ala Thr Met Pro
 260 265 270

Arg Val Ser Glu Asp Val Tyr Arg Ser His Val Ala Gly Gln Met Leu
 275 280 285

His Gly Gly Gly Ser Arg Leu Asn Ser Gly Asn Arg Trp Phe Asp Lys
 290 295 300

Thr Leu Gln Phe Ile Val Ala Glu Asp Gly Ser Cys Gly Leu Val Tyr
 305 310 315 320

Glu His Ala Ala Ala Glu Gly Pro Pro Ile Val Thr Leu Leu Asp Tyr
 325 330 335

Val Ile Glu Tyr Thr Lys Lys Pro Glu Leu Val Arg Ser Pro Met Val
 340 345 350

Pro Leu Pro Met Pro Lys Lys Leu Arg Phe Asn Ile Thr Pro Glu Ile
 355 360 365

Lys Ser Asp Ile Glu Lys Ala Lys Gln Asn Leu Ser Ile Met Ile Gln
 370 375 380

Asp Leu Asp Ile Thr Val Met Val Phe His His Phe Gly Lys Asp Phe
 385 390 395 400

Pro Lys Ser Glu Lys Leu Ser Pro Asp Ala Phe Ile Gln Met Ala Leu
 405 410 415

Gln Leu Ala Tyr Tyr Arg Phe Tyr Gly Lys Glu Cys Ala Thr Tyr Glu
 420 425 430

Ser Ala Ser Leu Arg Met Phe His Leu Gly Arg Thr Asp Thr Ile Arg
 435 440 445

Ser Gly Ser Met Asp Ser Leu Thr Phe Val Lys Ala Met Asp Asp Ser
 450 455 460

Ser Val Thr Glu His Gln Lys Val Glu Leu Leu Arg Lys Ala Val Gln
 465 470 475 480

Ala His Arg Gly Tyr Thr Asp Arg Ala Ile Arg Gly Glu Gly Phe Asp
 485 490 495

Arg His Leu Leu Gly Leu Lys Leu Gln Ala Ile Glu Asp Leu Val Ser
 500 505 510

Met Pro Asp Ile Phe Met Asp Thr Ser Tyr Ala Ile Gly Met Tyr Phe
 515 520 525

His Leu Ser Thr Arg Gln Val Pro Ala Lys Lys Met Cys His Val Leu
 530 535 540

Arg Ala Arg Gly Pro Arg Arg Val Arg Cys Leu Tyr Asn Pro Met Glu
 545 550 555 560

Gly His Ile Asn Phe Ser Leu Ser Asp Tyr Lys Arg Trp Gly Glu Thr
 565 570 575

Asn Ala Ala Arg Leu Val Tyr Tyr Leu Glu Lys Ala Leu Leu Asp Met
 580 585 590

Arg Ala Leu Val Lys Ser His Pro Arg Ala Lys Phe Leu Ala Pro Arg
 595 600 605

Thr Gln Ala Cys Gln Cys His Arg Gln Ala His Pro Arg Met Gly His
 610 615 620

Pro Pro Gly Ile Ser Ser Leu Val Pro Ser Ser Leu Val Pro Ser Ser
 625 630 635 640

Leu Val Pro Pro Ile Leu Leu Ser His Gly Pro His Pro Pro Gly Gly
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Cys Arg Pro Ser Gln Val Pro Ser Val Gly His Pro Ser Thr Cys Gln
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Gly Pro Thr Trp Gly
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 <223> Contains a BamHI restriction enzyme site

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 cgcgagatcc accatgaagg cttccagccg cttc

34

<210> 4
 <211> 28
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Contains complementary sequences to an XbaI site

<400> 4
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28

<210> 5
 <211> 34
 <212> DNA
 <213> Artificial sequence

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 <223> Contains a Bam H1 restriction enzyme site

<400> 5
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<210> 6
 <211> 27
 <212> DNA
 <213> Artificial sequence

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 <223> Contains the cleavage site for the restriction endonuclease
 Asp718

<400> 6
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<210> 7
 <211> 34
 <212> DNA
 <213> Artificial sequence

<220>
 <223> Contains a Bam HI site

<400> 7
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<210> 8
 <211> 58
 <212> DNA
 <213> Artificial sequence

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 <223> Contains complementary sequences to an Xba I site, translation
 stop codon, and an HA tag

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